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Georgia Southern University

Georgia Southern Examines Coliphage as a Quality Indicator of Beach Water

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Gastrointestinal disease affects millions of people in the United States and places a substantial economic burden upon healthcare systems. Recreational waters polluted with fecal material are a main source for transmission of gastrointestinal disease. Georgia beaches are monitored for the presence of fecal indicator bacteria, but these bacteria are not well associated with enteric viruses. The United States Environmental Protection Agency (US EPA) has recently proposed coliphage (a virus of Escherichia coli) as an alternative indicator of fecal contamination in recreational waters. The present study compares fecal indicator bacteria and coliphage concentrations at two Georgia beaches with adjacent creeks that have a history of pollution.

For one year, samples and environmental data were collected from four sites on Jekyll Island, GA, during the peak swimming season and the off-season. Samples were processed using US EPA-approved methods for membrane filtration and plaque formation. Statistical analyses were performed using t-tests and Spearman correlations.

The highest numbers of enterococci and significant differences with coliphage were found at Saint Andrews Creek during the swimming season and the off-season. The enterococci concentrations at Clam Creek sites did not exceed recommended recreational water criteria. During the off-season, concentrations of enterococci and coliphages were different at Clam Creek sites, indicating a potential risk for presence of enteric virus when enterococci could not be detected.

The US EPA has proposed to adapt coliphage concentrations as an alternative indicator of water pollution for routine beach monitoring nationally. The present study provides a background for adoption of this method in Georgia. Measures of enterococci do not provide sufficient information about the associated human health risk. Inclusion of these viral indicators will improve decision making for beach closures and for protection of the health of swimmers.

“Coliphage as an indicator of the quality of beach water to protect the health of swimmers in coastal Georgia,” was recently published in the Journal of the Georgia Public Health Association.

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